

REMARKS:

I. Summary of the Invention

The present invention provides methods for using ionic liquids as solvents. Ionic liquids are compounds consisting of ions that exist as stable liquids above a specific melting point. Most currently available ionic liquids have high melting points and high viscosities, which limits their usefulness as solvents. Applicant of the present invention has discovered that ionic liquids comprising hydroxyalkyl substituted ammonium ions are useful as solvents in various applications. The hydroxyalkyl substituted ammonium ion-containing ionic liquids have low melting points and low viscosities, making them ideal solvents for many applications. For example, a hydroxyalkyl substituted ammonium ion-containing ionic liquid provides a more polar, protic, hydrogen bonding environment, which mimics the environment provided by an aqueous solvent. Thus, enzyme-catalyzed reactions that previously could not be carried out in non-aqueous environments may be preformed in the presence of these hydroxyalkyl-substituted ammonium ion-containing ionic liquids. Moreover, these ionic liquids not only have low viscosities, but also high solvation capabilities and low toxicities, making them useful in a broader range of applications than the previously available ionic liquids.

II. Status of the Claims

Claims 57, 58, and 62-70 are pending. Claims 1-56 and 59-61 are canceled. By this amendment, claims 57 and 58 are amended, and new claims 62-70 are added. The amendments and the new claims are supported by the specification and do not add new matter.¹

¹ Support for the amendment to claim 57 may be found in claim 58. Support for the amendment to claim 58 may be found in published paragraph 0011 of the pending application. Support for new claim 62 may be found in canceled claim 32. Support for the new claim 63 may be found in canceled claim 36. Support for new claim 64 may be found in canceled claim 37. Support for new claim 65 may be found in canceled claims 40 and 42. Support for new claim 66 may be found in canceled claim 43. Support for new claim 67 may be found in canceled claim 54. Support for new claim 68 may be found in canceled claim 32. Support for new claim 69 may be found in canceled claims 40 and 42. Support for new claim 70 may be found in canceled claim 43.

III. Restriction Requirement

Applicant affirms election of the species N,N-dimethylethanolammonium formate. Applicant reserves the right to file divisional and/or continuation applications to the non-elected species.

IV. Claim Objections

Claims 59-61 were objected to for being in improper form. Since claims 59-61 have been canceled, these objections are moot.

V. 35 U.S.C. § 102 Rejections

In light of the cancellation of claims 32, 34, 36, 37, 40, 42, 43, and 54-56, Applicant respectfully requests withdrawal of the 35 U.S.C. § 102(b) rejections of claims 32, 34, 36, 37, 40, 42, 43, and 54-56 in view of CAS Registry No. 59101-30-3 (Nov. 16, 1984).

VI. 35 U.S.C. § 103 Rejections

In view of the cancellation of claims 32, 34, 36, 37, 40, 42, 43, and 54-56, Applicant respectfully requests withdrawal of the 35 U.S.C. § 103(a) rejections of claims 32, 34, 36, 37, 40, 42, 43, and 54-56 in view of CAS Registry No. 59101-30-3 or in view of Rogier et al. (US 2003/0232844).

Reconsideration is respectfully requested of the rejection of claims 57 and 58 under 35 U.S.C. § 103(a) in view of Rogier et al.

Three criteria must be present to establish a *prima facie* case of obviousness.² First, the prior art reference or references must teach or suggest all the claim limitations. Second, notwithstanding KSR,³ there must be some suggestion or motivation in the knowledge generally available to one of ordinary skill in the art to modify the reference or the references. Third, there must be a reasonable expectation of success. Not one of these three criteria is satisfied by the disclosure of Rogier et al. when considered

² M.P.E.P. § 2143.

³ KSR International Co. v. Teleflex Inc., 550 USPQ2d, 1385 (2007).

alone or in combination with knowledge available to those of ordinary skill in the art at the time the invention was made.

Claims 57 and 58 are directed to methods for using an ionic liquid as a solvent, wherein the ionic liquid comprises a hydroxyl alkyl substituted ammonium ion. One of the recited applications in claim 57 and the specific application of claim 58 is the use of the hydroxyalkyl substituted ammonium ion-containing ionic liquid as a solvent in an enzyme-catalyzed reaction. Rogier et al. do not disclose or suggest using an ionic liquid as a solvent in an enzyme-catalyzed reaction as required in claims 57 and 58. Rather Roger et al. merely disclose a metallomatrix protease as a type of anti-neoplastic agent.⁴ As noted by the Office, it is “well known that the protease enzyme catalyzes a reaction with protein.”⁵ Rogier et al., however, do not disclose or suggest using an ionic liquid such as N,N-dimethylethanolammonium formate as a solvent in the protease-catalyzed reaction. Moreover, there is no plausible rationale that a person of ordinary skill in the art at the time the invention was made would have modified the disclosure of Rogier et al. and used an ionic liquid as a solvent in the protease-catalyzed reaction. Because Rogier et al. do not disclose or suggest using ionic liquids as solvents in enzyme-catalyzed reactions or provide any rationale for one of ordinary skill in the art to modify the disclosure of Rogier et al. to arrive at the present invention with a reasonable expectation of success, Applicant respectfully submits that claims 57 and 58 are not obvious in view of Rogier et al.

In view of the foregoing, Applicant respectfully requests withdrawal of the § 103 rejections of claims 57 and 58 in view of Rogier et al.

VII. New Claims 62-70 are Novel and Non-Obvious

It is respectfully submitted that new claims 62-67, which depend from and incorporate the limitations of claim 57, and new claims 68-70, which depend from and incorporate the limitations of claim 58, are novel in view of the cited art. Moreover, it is submitted that new claims 62-67, which depend from and incorporate the limitations of claim 57, likewise are not rendered obvious by Rogier et al. for the same reasons stated

⁴ Rogier et al., at paragraph 0030.

⁵ Office Action dated 3/24/2009, at page 5.

above with respect to claim 57. Similarly, new claims 68-70, which depend from and incorporate the limitations of claim 58, likewise are not obvious in view of Rogier et al. for the same reasons presented above with respect to claim 58.

VIII. Conclusions

In light of the foregoing, the Applicant requests entry of the claim amendments, entry of the new claims, withdrawal of the claim rejections, and solicits an allowance of all pending claims. The Examiner is invited to contact the undersigned practitioner should any issues remain unresolved.

Respectfully submitted,

POLSINELLI SHUGHART PC

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By: /Shirley T. Bissen/

Shirley T. Bissen, Reg. No. 57,769
100 South Fourth Street, Suite 1100
St. Louis, Missouri 63102
Tel: (314) 889-8000
Fax: (314) 231-1776
Patent Agent